

SECTION UC-000
DONATION WATER MAINS

PART 1 - GENERAL

1.01 SCOPE

- A. The purpose of these Specifications is to establish uniform MD-WASD requirements for material and installation procedures for donation water mains in sizes 24-inches and smaller. The MD-WASD does not permit the use of 10-inch, 14-inch or 18-inch pipe, fittings or valves, except as may be approved for connections to existing mains. References herein to pipe, fittings and valves in these size ranges are for informational purposes only. Only those features which are considered necessary to provide acceptable materials and a satisfactory installation have been included.
- B. Specifications for projects which include mains larger than 24 inches shall be submitted to the MD-WASD for approval on a case-by-case basis.
- C. This Specification does not purport to cover all material or installation procedures which may be required, whether by the nature of the proposed work, or by the MD-WASD, or by other regulatory agencies.
- D. It is intent of the MD-WASD to obtain a complete and working installation under this project, and any items of labor, equipment or materials which may reasonably be assumed as necessary to accomplish this end shall be supplied whether or not they are specifically shown on the Plans or stated herein.

1.02 QUALITY ASSURANCE

- A. All material and installation shall be in accordance with the MD-WASD's Design and Construction Standard Specifications and Details.
- B. The material and installation for this project shall be in full compliance with all applicable standards listed in Section 01090, "Reference Standards"

1.03 DEFINITIONS

See Section 01005, "Defined Terms"

1.04 PROJECT APPROVAL

The approval of the MD-WASD shall be secured, in accordance with Section UC-005, prior to any construction related activity.

1.05 SPECIAL CONDITIONS

A. The work shall proceed in accordance with the following specification sections, bound herein:

1. Section 01011 - Site Conditions
2. Section 01016 - Safety Requirements and Protection of Property
3. Section 01031 - Grades, Lines and Levels
4. Section 01100 - Special Project Procedures
5. Section 01750 - Maintenance of Traffic and Public Streets

B. Water for construction shall be provided in accordance with Section 01100.

1.06 PERMITS, INSPECTIONS AND FEES

- A. The Contractor shall obtain and pay for all permits, official inspections and all other official fees, in connection with the work, in accordance with Section 01740, "Permits".
- B. Inspection by MD-WASD personnel is required in addition to, not in lieu of, municipal and other County department inspections (if any).
- C. No installation will be accepted until it has passed all inspections, including pavement installation or replacement.

1.07 PRECONSTRUCTION CONFERENCE

Prior to commencement of the work, the Contractor shall attend a "Preconstruction Conference" in accordance with Section 01150, "Preconstruction Conference"

1.08 SUBMITTALS

- A. The Contractor shall submit all shop drawings in accordance with Section 01340.
- B. The Contractor shall furnish "As-Built" in accordance with Section 01725. Project Record Documents shall be submitted in accordance with Section 01720. The Contractor shall submit operating and maintenance instructions and all other submittals in accordance with Section 01730.
- C. Where the Specifications require test certification or certification that certain products or material furnished are as specified, the Contractor shall deliver such certification to the MD-WASD. No material or equipment shall be approved for use in the work until individual certification has been received.

1.09 SAFETY REQUIREMENTS

- A. The Contractor shall conduct the work in compliance with all applicable provisions of the Occupational Safety and Health Act of 1970, in general, and any subsequent amendments and revisions thereto and specifically to the provisions concerning confined space entry. The Contractor shall comply with all provisions of the State of Florida Trench Safety Act (TSA).

- B. The Contractor shall conduct his operations in such a manner, utilizing warning devices such as traffic cones, barricades and warning lights, and personnel such as flagmen and uniformed police officers, that the public is given adequate warning of hazards of the work site as may be deemed necessary by the County and/or the Engineer. See Section 01750, "Maintenance of Traffic and Public Streets."
- C. In the instance of men working within the manholes, the Contractor shall provide safety provisions to cover any possible consequences of structural failure and/or flooding. Such provisions might take the form of, but not be limited to, ladder nearby and in position to permit rapid egress; safety harness; stand-by pumping equipment; extra air supplies; and such other measures as the situation and good construction practices might indicate.
- D. Certain products specified in these Specifications contain warnings by the manufacturers that under certain conditions, if instructions for use of the product are not followed, a hazardous condition may exist. It is the Contractor's responsibility to instruct his workmen in the safe use of the product, or any product substitution.

PART 2 - PRODUCTS

2.01 GENERAL

The general requirements specified herein shall apply to all items of material and equipment, in addition to the Specifications for individual items appearing in PART 2, "PRODUCTS", of this section.

- A. All material for use in the Project shall be new and of recent domestic manufacture and shall be the products of reliable manufacturers or suppliers who, unless otherwise specified, have been regularly engaged in the manufacture of such materials and equipment for at least five (5) years.
- B. All fittings and components shall, wherever possible, be standard stock articles of well known manufacturers.
- C. Where the Specifications designate the products of a particular manufacturer, the product specified has been found suitable for the intended use, but, unless otherwise provided, articles or products of similar characteristics may be offered for the approval of the MD-WASDs, upon approval by the Engineer of Record.
- D. Copies of complete descriptive data shall be furnished regarding all material, consisting of dimension drawings, catalog references and other information necessary to clearly identify and evaluate each article.
- E. When substitutions are permitted, the Contractor shall make all necessary changes in adjacent or connected structures and equipment, at his expense.
- F. Unless otherwise specified, all steel bolts, nuts, washers and all other miscellaneous ferrous metal items (except cast iron and stainless steel) furnished by the Contractor shall be hot-dip galvanized

in accordance with ASTM A386, "Zinc Coating (Hot-Dip) on Assembled Steel Products" and ASTM A385, "Providing High-Quality Zinc Coatings (Hot-Dip)". Where the word "galvanized" or its abbreviation is used on the Plans or in the Specifications, it shall mean hot-dip galvanized. Fabricated items shall be hot-dip galvanized after fabrication. Internal threads shall be tapped or re-tapped after galvanizing.

- G. Where miscellaneous materials are required for a complete installation, the Contractor shall provide such materials in conformance with Section 15065, "Miscellaneous Material".
- H. The requirements of Section 01600, "Material and Equipment Shipment, Handling, Storage and Protection" shall be strictly adhered to, where applicable.

2.02 CASTINGS

A. GENERAL

1. Material used in the manufacture of the castings shall conform to ASTM A48, "Gray Iron Castings", for Class 30 iron. Manhole and valve box covers shall have a roadway type surface.
2. Castings shall be in compliance with Section 05550. Castings shall be as manufactured by U.S.F. Fabrication, Inc., Neenah Foundry, or approved equal.
3. Castings shall be furnished unpainted with shot blasted finish.

B. MANHOLE FRAMES AND COVERS

Manhole covers and frames shall be MD-WASD Type "A" (See Std. Detail SS 4.0), U.S.F. No. 310 as manufactured by U.S.F. Fabrication, Inc., Hialeah, Florida, or approved equal. The covers shall be cast labeled "WATER", shall have a roadway type surface, shall be non-rocking, and in compliance with Section 05550.

C. METER BOX COVERS

Cast iron meter covers shall have the words "WATER METER" plus the manufacturer's name permanently marked on the top surface of the cover. The letter size may range from 3/8 inch to 3/4 inch with the larger size covers having the larger size letters. The letters on the cast iron covers shall be slightly raised. Covers shall have a non-skid surface pattern, and shall be furnished with cast iron meter-reading lids. (See Section 05550)

D. VALVE BOXES AND COVERS

Valve boxes for use with all main line valves, air release devices and flushing valve outlets shall be MD-WASD No. 3. Valve boxes for use with fire hydrants, service lines, by-pass valves and fire line valves shall be MD-WASD No.2. Valve box covers shall be cast labeled with the letter "W", shall have a roadway type surface, shall be non-rocking, and in compliance with Section 05550..

2.03 BRICK

- A. Concrete brick shall conform to ASTM Standard C55 "Concrete Building Brick". Clay brick may be substituted for concrete brick. Clay brick shall conform to ASTM Standard C62, "Building Brick (Solid Masonry Units Made from Clay or Shale)".
- B. Bricks shall have true edges and sharp corners and shall have been cured for at least 14 days before being placed.

2.04 CONCRETE, MORTAR AND GROUT

See Section UC-033, "Concrete, Mortar and Grout (Short)"

2.05 FIRE HYDRANTS

See Section 15330, "Fire Hydrants"

2.06 METER BOXES, SECTIONAL PLATES AND VAULTS

See Section UC-080, "Meter Boxes, Sectional Plates and Vaults for Water Service"

2.07 METER VALVES

See Section UC-085, "Water Meters Valves"

2.08 PILING

See Section UC-090, "Piling for Aerial Crossing"

2.09 PIPE AND FITTINGS - CAST DUCTILE IRON

SEE Section 15060, "Piping and Fittings"

2.10 PIPE AND FITTINGS - GALVANIZED STEEL

See Section 15060, "Piping and Fittings".

2.11 PIPE AND FITTINGS - POLY (VINYL CHLORIDE) (PVC)

See Section 15060, "Piping and Fittings"

2.12 STEEL CASING PIPE

See Section 15070, "Jacking and Boring"

2.13 STEEL PIPE FOR CANAL CROSSING

See Section 15075, "Aerial Crossing"

2.14 REINFORCING STEEL

- A. Bar reinforcement for concrete structure shall conform to the requirements of ASTM Standard A615, Deformed and Plain Billet-Steel Bars for concrete Reinforcement", Grade 60, Deformed, except that steel manufactured by the Bessemer Process will not be accepted. Wire mesh reinforcing for concrete structures shall be welded wire fabric meeting the requirements of ASTM Standard A185 "Steel Welded Wire Fabric, Plain, for Concrete Reinforcement".
- B. The Contractor shall furnish the MD-WASD with the manufacturer's test certificates showing the steel to meet the above requirements, in addition to which the Engineer may take representative samples from the material on the job and have them tested by an independent testing laboratory.
- C. Completely detailed shop drawings and bending schedules shall be submitted by the Contractor for the approval of the MD-WASD. Such approval shall be obtained before the bars are cut and bent.

2.15 STRUCTURAL STEEL

- A. All structural steel shall be of new stock, of domestic manufacture only. The steel shall meet the requirements of ASTM A36, "Structural Steel". The Contractor shall furnish the MD-WASD with manufacturer's test certificates showing that the steel has met the above requirements, in addition to the which the MD-WASD may take representative samples from the material on the job and have them analyzed by an independent testing laboratory.
- B. Steel vault covers shall conform to ASTM A36 for material, and shall have the name of the manufacturer and date of manufacture permanently marked on the bottom side of the covers in letters 3/4-inch in size. The plate thickness of each item shall be as indicated in the Standard Details, exclusive of projecting lugs. The covers shall have reading lids, a non-skid diamond surface pattern and shall be non-rocking. Sizes, configurations and type of reading lids are shown in the Standard Details. Following fabrication of the covers, including reading lids and permanent markings, they shall be thoroughly cleaned and hot-dip galvanized.
- C. All steel vault covers and hardware, including pipe support brackets, pipe straps, and pedestrian guards with the expanded metal fabric, and all nuts, bolts and washers for canal crossings, shall be hot-dip galvanized after fabrication in accordance with ASTM A386.

2.16 TAPPING SLEEVES

See Section 15102, "Tapping Sleeves and Tapping Valves"

2.17 VALVES

- A. Angle Valve - Section 15130
- B. Butterfly Valve - Section 15110
- C. Swing Check Valve - Section 15115

- D. Gate Valves - Section 15120
- E. Meter Valves - Section UC-085
- F. Plug Valves - Section 15125
- G. Tapping valve - Section 15102
- H. Other miscellaneous valves - Section 15130

2.18 BACKFILL AND EMBEDMENT MATERIAL

Backfill, Select Backfill and Embedment material, for bedding, shall be as specified in Section 02315.

2.19 MISCELLANEOUS MATERIAL

- A. Section 15065 specifies material necessary for a complete installation, not specified herein. These materials, including the following, shall be furnished and installed by the Contractor, when required, whether shown on the Plans, or not.
 - 1. Anchor bolts, nuts and washers
 - 2. Banding straps for pipe skids
 - 3. Blind flanges, cast iron
 - 4. Check valves in meter hook-ups
 - 5. Copper tubing
 - 6. Corporation stops
 - 7. Coupling adapters
 - 8. Gasket lubricant
 - 9. Grout for boring and jacking (if required)
 - 10. Guard post for fire hydrants
 - 11. Joint materials for flanged pipe, valves and fittings
 - 12. Meter couplings
 - 13. Paint, for fire hydrants and guard posts
 - 14. Polyethylene encasement material
 - 15. Polyethylene sheets for concrete anchors
 - 16. Riprap
 - 17. Roofing felt
 - 18. Sand for casing
 - 19. Service insulator assembly
 - 20. Street elbow (90 Degrees)
 - 21. Tie rods
 - 22. Timber skids and blocking
 - 23. Zinc rich paint (for galvanizing items with minor damage)

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

- A. The Contractor's Registered Land Surveyor shall establish the line and grade in the field for the pipeline. Except as otherwise approved by the MD-WASD, line and grade shall consist of establishing all points of bend and other stations not more than 100 feet apart along the proposed centerline of the pipe, or along a stationed offset line as shown on the Plans, marked by a nail in a metal cap if in pavement, with the station painted nearby or by a nail in the top of a wooden stake driven flush with the ground with the station marked on a flag stake nearby, if not in pavement. The Contractor shall install the pipe to the lines and grades shown on the Plans without help from the MD-WASD, and shall supply all equipment and personnel necessary to accomplish this end.
- B. The Contractor shall make his equipment and men available to the Inspector for spot checking the accuracy of the pipe laying but shall not rely on the Inspector to set each pipe and fitting for him. The Inspector shall require the pipe to be brought within the tolerances specified in subsection 3.04, "Installation of Pipe and Fittings," herein, before the backfill is placed. If, due to unforeseen conditions, the line or grade of the pipe has to be changed from the planned location, the pipe shall not be concealed until the Inspector has noted the actual location, and the Contractor shall record the same for use in the preparation of Record Drawings.
- C. The ends of existing mains shall be temporarily capped or plugged and anchored to keep them clean and the joints from blowing apart from internal pressure until the new main can be connected to them.
- D. Where existing paving is damaged or removed by the Contractor, temporary paving, as specified in Section 02745, shall be placed the same day as the ditch backfill and it shall be replaced with permanent paving, where shown on the Plans, within thirty (30) days.
- E. In addition to specific construction methods specified elsewhere, the following general requirements shall apply to the work under this project.
 - 1. Pipe and fittings shall at all times be handled with great care to avoid damage. In loading and unloading, they shall be lifted with cranes or hoists or slid or rolled on skidways in such manner as to avoid shock. Under no circumstances shall this material be dropped or allowed to roll or slide against obstructions. Pipe and other material shall be distributed along the right-of-way in advance of installation only to the extent approved by the MD-WASD. Such materials shall be so placed as to keep obstruction to traffic at a minimum.
 - 2. Any work within the pipe and fittings shall be performed with care to prevent damage to the lining. Damaged lining shall be repaired or the pipe section or fitting replaced as required by the MD-WASD. No cables, lifting arms, hooks or other devices shall be inserted into the pipe or fitting. All lifting, pulling or pushing mechanisms shall be applied to the exterior of the pipe or fitting.
 - 3. The Contractor's attention is called to the fact that connections to existing mains will probably involve the removal of a concrete anchor and cast iron plug; also that the existing mains may be cast iron with poured lead sulphur compound, or rubber gasket type joints, concrete with flanged outlet connections, galvanized iron with threaded joints, or others. The Contractor should be equipped with the proper tools and equipment to

make connections to any one or more of these existing mains.

4. Where required by the MD-WASD and at his discretion, the Contractor shall eliminate dust annoyance to adjacent property owners by sprinkling his work area with water or by other approved means.
- F. When mains are to be installed within existing street areas, the Contractor shall limit the amount of ditch open at any one time to one block (approximately 600 feet) . The work in each block, including excavation, pipe laying, backfilling and temporary paving shall be completed before proceeding with the work in the next block.
- G. Boring and jacking operations and trenches remaining open to facilitate the repair of existing underground utilities damaged by the Contractor during excavation shall not be deemed a portion of the allowable 600 feet of open trench, unless otherwise decided by the MD-WASD at its discretion.
- H. When mains are to be installed within existing street areas, the Contractor may employ more than one installation crew on the Project but not less than 1200 feet shall separate any two open trench sections as defined hereinbefore.

3.02 EXCAVATION

See Section 02315, "Trenching & Backfilling for Piping Systems

3.03 WATER SERVICE INSTALLATIONS

See Section UC-075, "Service Installations"

3.04 INSTALLATION OF PIPE AND FITTINGS

- A. The centerline of the pipe shall not vary by more than two inches from the location shown on the Plans and the top of the pipe shall not vary by more than two inches from the established grade, except at points where this tolerance must be changed to clear obstructions or make connections. Deviation from this location will be permitted only upon approval from the MD-WASD.
- B. Upon satisfactory excavation of the pipe trench and completion of the pipe bedding, up to the level of the outside bottom of the proposed pipe barrel, recesses for the pipe bells, or couplings, shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support and no pressure will be exerted on the pipe joints from the trench bottom. Placing and compacting the bedding up to the level of the lower one-third of the pipe barrel shall immediately follow the installation of the pipe.
- C. The interior of the pipes shall be thoroughly cleaned of all foreign matter before being gently lowered into the trench and shall be kept clean during laying operations by means of plugs or other approved methods. During suspension of work for any reason at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe. Any pipe found defective shall be immediately removed and replaced

with sound pipe.

- D. Lines shall be laid straight and depth of cover shall be maintained as shown on the Plans. Grades or pipe centerline elevations are shown on the Plans. The Contractor will be permitted to use surveying instruments to maintain alignment and grade. At least one elevation shot shall be taken every one hundred feet (100') or portion thereof and deviation along the pipeline.
- E. All bends, tees and plugs shall be backed with concrete thrust blocks to undisturbed ground. Encasement type thrust anchors and collars shall be placed where indicated on the Plans. The bearing area and/or volume of concrete in the anchors and blocks shall be as shown on the Plans or Standards.
- F. All bolts, nuts, gaskets and other joint materials for use in the pipeline shall be properly protected.
- G. Gaskets shall be properly stored, and care shall be exercised to keep them away from heat, light, oil, gasoline or other petroleum products. Gaskets shall be kept clean at all times and not handled with greasy or dirty hands. Gaskets shall be installed just prior to installation of pipe.
- H. The joints of all pipelines shall be properly homed. The particular joint used shall be approved by the Engineer prior to installation.
- I. Unless otherwise directed, cast iron pipe shall be laid with the bell ends facing in the direction of laying; and for lines on an appreciable slope, the bells shall, at the discretion of the Engineer, face upgrade.
- J. Push-on, restrained push-on and mechanical joints in ductile cast iron pipe and fittings shall be made in accordance with the manufacturer's standards except as otherwise specified herein. Joints between push-on and mechanical joint pipe and/or fittings shall be made in accordance with AWWA Standard C600, "Installation of Ductile Iron Water Mains and Their Appurtenances", except that deflection at joints shall not exceed one half of the manufacturer's recommended allowable deflection, or one-half of the allowable deflection specified in AWWA C600, whichever is the lesser amount.
- K. Before laying push-on, restrained push-on and mechanical joint pipe and fittings, all lumps, blisters and excess bituminous coating shall be removed from the bell and spigot ends. The outside of each spigot and the inside of each bell shall be wire brushed, and wiped clean and dry. The entire gasket groove area shall be free of bumps or any foreign matter which might displace the gasket. The cleaned spigot and gasket shall not be allowed to touch the trench walls or trench bottom at any time. Vegetable soap lubricant shall be applied in accordance with the pipe manufacturer's recommendations, to aid in making the joint. The workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Deflections shall be made only after the joint has been assembled.
- L. Flanged joints shall be used only where indicated on the Plans. Before making up flanged joints in the pipeline, the back of each flange under the bolt heads and the face of each flange shall have all lumps, blisters and excess bituminous coating removed and shall be wire brushed and wiped clean and dry. Flange faces shall be kept clean and dry when making up

the joint, and the workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Bolts and nuts shall be tightened by opposites in order to keep flange faces square with each other, and to insure that bolt stresses are evenly distributed.

- M. Bolts and nuts in flanged and mechanical joints shall be tightened in accordance with the recommendations of the pipe manufacturer for a leak-free joint. The workmen shall exercise caution to prevent overstress. Torque wrenches shall be used until, in the opinion of the Engineer, the workmen have become accustomed to the proper amount of pressure to apply on standard wrenches.
- N. Cutting of ductile iron pipe for inserting valves, fittings, etc., shall be done by the Contractor in a neat and workmanlike manner without damage to the pipe, the lining, or the coating. Pipe, shall be cut with a mechanical pipe saw. After cutting the pipe, the plain end shall be filed to remove all sharp edges and burrs.
- O. The pipe shall be restrained at reaction points as specified and shown on the Plans. The pipe manufacturer shall instruct the Contractor in the making of such joints. In addition, concrete thrust blocks shall be placed at all bends, tees, plugs and other fittings. Encasement-type thrust anchors and collars shall be placed where indicated on the Plans.
- P. Taps into ductile iron pipe for corporation stops shall be AWWA tapered thread only, and the Contractor shall provide suitable equipment for this purpose as approved by the MD-WASD. After the tap has been made, coat the inside of the pipe around the tap with Carboguard 891 White 1898, by Somay Products, or approved equal. Also, after the installation of corporation stop, heavily coat the exposed exterior surfaces of the stop with Carboguard 891 White 1898, by Somay Products, or approved equal
- Q. Any work within the pipe shall be performed with care to prevent damage to the lining. Damaged lining shall be repaired as recommended by the pipe manufacturer or the pipe section replaced as required by the Engineer. No cables, lifting arms or other devices shall be inserted into the pipe. All lifting, pulling, or pushing mechanisms shall be applied to the exterior of the pipe barrel.
- R. Unless otherwise approved by the Engineer, the pipeline shall be cleaned by pigging at intervals not to exceed 30 lengths of pipe. Cleaning methods shall meet the Engineer's approval, and must be sufficient to remove silt, rocks, or other debris which may have entered the pipeline during its installation.

- S. Polyethylene encasement of cast/ductile iron pipe and fittings, riser pipe and valves, if required by the MD-WASD, shall be installed in accordance with ANSI/AWWA C105/A21.5, "Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids" Method A or B.
- T. Polyethylene encasement of valves and ductile iron riser pipes, if required by the MD-WASD, shall be installed in accordance with ANSI/AWWA C105/A21.5, "Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids" Method A , B or C.
- U. Lines shall be laid straight and depth of cover shall be maintained as shown on the Plans. Grades or pipe centerline elevations are shown on the Plans. The Contractor shall be permitted to use surveying instruments to maintain alignment and grade. At least one elevation shot shall be taken on each length of pipe and recorded. No abrupt changes in direction or grade will be allowed.

3.05 CLEANING, TESTING AND DISINFECTION

See Section UC-170, "Cleaning and Testing Main"
See Section UC-175, "Disinfection of Water Main"

3.06 PAVEMENT RESTORATION

See Section 02510, "Pavement Removal and Replacement"

3.07 PAINTING

See Section 09900, "Painting (Short)"

3.08 FINAL ACCEPTANCE BY MD-WASD

The following conditions must be met prior to acceptance of the Project by the MD-WASD:

1. Where the mains fall within a pavement area, the area shall have the road rock base course placed and compacted prior to testing the mains. Final pavement installation shall be completed prior to acceptance. All castings within a pavement area shall be set with the top surface flush with the new pavement.
2. All mains and appurtenances shall be flushed, pressure tested and disinfected. All mains and appurtenances must be approved for service by the Dade County Health Department in accordance with Section UC-170 and UC-175.
3. All meter boxes and fire hydrants shall be installed within concrete slabs to the dimensions shown in the Standard Details.
4. Acceptance by any other governing agency, if any.
5. Final field inspection and completion of punch list items, if any, to the MD-WASD's satisfaction.

6. Final cleanup of work site in accordance with Section 01710.
7. Delivery and approval of "As Built" record drawings in accordance with Section 01725.
8. Final acceptance by the MD-WASD.

END OF SECTION